AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A diamond n-type semiconductor comprising:

a first diamond semiconductor which has n-type conduction and in which a distortion or defect is artificially formed,

wherein said first diamond semiconductor contains at least one kind donor element of 5 x 10^{19} cm^{-3} or more in total and an impurity element other than the donor element, the contained amount of the impurity element being lower than the total contained amount of the donor element,

whereby said first diamond semiconductor has ~~an n-type dopant concentration adjusted by vapor phase growth such that~~ an electron concentration ~~of said first diamond semiconductor exhibits~~ exhibiting a negative correlation with temperature, in a temperature range having a width of 100°C or more and included within a temperature region from 0°C to 300°C, [[and]]

wherein the donor element includes phosphorous (P), and the impurity element ~~is Si~~ includes silicon (Si) having a contained amount of 1 x 10^{17} cm^{-3} or more and locally existing in said first diamond semiconductor as a material for restraining the deterioration of diamond crystallinity caused by the doping of the donor element, and

wherein both P and Si are incorporated during vapor-phase growth of said first diamond semiconductor.

2. (Previously Presented) A diamond n-type semiconductor according to claim 1, wherein said first diamond semiconductor has a Hall coefficient exhibiting a positive correlation with temperature, in the temperature range.

3. (Previously Presented) A diamond n-type semiconductor according to claim 1, wherein the temperature range, included within the temperature region from 0°C to 300°C, has a width of over 200°C or more.

4. (Previously Presented) A diamond n-type semiconductor according to claim 1, wherein said first diamond semiconductor has a resistivity of 500 Ωcm or less at a temperature within the temperature region from 0°C to 300°C.

5. (Previously Presented) A diamond n-type semiconductor according to claim 1, wherein the electron concentration of said first diamond semiconductor is always 10^{16} cm^{-3} or more in the temperature region from 0°C to 300°C.

6. (Cancelled)

7. (Cancelled)

8. (Previously Presented) A diamond n-type semiconductor according to claim 1, wherein said first diamond semiconductor contains at least S (sulfur) as the donor element.

9. (Cancelled)

10. (Cancelled)

11. (Previously Presented) A diamond n-type semiconductor according to claim 1, wherein said first diamond semiconductor is monocrystal diamond.

12. (Previously Presented) A diamond n-type semiconductor according to claim 1, further comprising a second diamond semiconductor provided adjacent to said first diamond semiconductor and turned out to be n-type,

wherein said second diamond semiconductor has an electron concentration not exhibiting a negative correlation with temperature and a Hall coefficient not exhibiting a positive correlation with temperature, in the temperature range.

13. (Previously Presented) A semiconductor device at least partly employing a diamond n-type semiconductor according to claim 1.

14. (Previously Presented) An electron emitting device having the diamond n-type semiconductor according to claim 1 employed in at least an electron emitting part thereof.

15. (Previously Presented) A method of manufacturing a diamond n-type semiconductor according to claim 1, said method comprising the steps of:

preparing a diamond substrate; and

epitaxially growing a diamond semiconductor on said diamond substrate by vapor phase growth while artificially introducing an impurity element other than a donor element to said diamond substrate, whereby said diamond semiconductor has n-type conduction and has a distortion or defect which is artificially formed therein,

wherein the Si is artificially introduced as the impurity element to said diamond substrate.

16. (Cancelled)